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R. Bruce Scott
Commissioner

STATE PLANNING AND ENVIRONMENTAL ASSESSMENT REPORT (SPEAR)

Regional Facilities Plan for the City of Stanford
City of Stanford, Lincoln County, Kentucky
AI: 2723; PLN20090001

The City of Stanford has submitted for approval by the Energy and Environment Cabinet (EEC) a regional facility plan titled *City of Stanford Wastewater Facilities Plan* dated May, 2009. In accordance with KRS Chapter 224 and 401 KAR 5:006, the Department for Environmental Protection (DEP) has prepared a State Planning and Environmental Assessment Report (SPEAR) that summarizes the project.

The DEP is required to conduct reviews of the potential environmental impacts of projects applying for funding by the Clean Water State Revolving Fund in accordance with the procedures contained in the State Revolving Fund Operating Agreement between the Environmental Protection Agency Region IV and the Commonwealth of Kentucky. The DEP has included this required review in the attached SPEAR. The DEP has determined that the projects in the SPEAR will not have a significant effect on the environment when all mitigative measures in Section F of the SPEAR are implemented.

The SPEAR contains information supporting this determination in the following sections: A) Project Summary; B) Existing Environment; C) Existing Wastewater Facilities; D) Need for Project; E) Alternatives Analysis; F) Environmental Consequences, Mitigative Measures; G) Public Participation and User Rates; and H) Sources Consulted.

Interested persons are encouraged to submit comments on this SPEAR within 40 days of the above date. The EEC will take no action on this project until after the State Clearinghouse review and public comment period has ended, and will evaluate all comments before a decision is made to proceed with approval of the project or awarding of SRF funds for this project. Send comments to Ms. Anshu Singh, Supervisor, Wastewater Planning Section, Water Infrastructure Branch, Division of Water, 200 Fair Oaks 4th Floor, Frankfort, Kentucky 40601, or by e-mail to anshu.singh@ky.gov, or call her at (502) 564-3410, extension 4805.

Sincerely,

R. Bruce Scott, Commissioner
Department for Environmental Protection

RBS/AS

STATE PLANNING AND ENVIRONMENTAL ASSESSMENT REPORT (SPEAR)
City of Stanford, Lincoln County, Kentucky
AI # 2723; PLN20090001

A. Project Summary and Funding Status

Project Summary: The city of Stanford (City) own and operates wastewater treatment plant (WWTP) and collection system. The plant was built in 1987 and designed to treat 0.8 million gallons per day (mgd). The collection system was built in the 1950s and is experiencing excessive infiltration and inflow (I/I). The I/I is overloading the WWTP and causing routine violations of the discharge permit limits. The Division of Enforcement and the City of Stanford are negotiating the terms of an Agreed Order to address the violations. This Agreed Order would require the City to conduct a sanitary sewer evaluation survey (SSES) and prepare a corrective action plan. The City submitted a Wastewater Facilities Plan (June, 2009), in which it has proposed plans to reduce inflow and infiltration (I/I), extend the collection system to un-sewered portions of the planning area, and upgrade the treatment system to meet its 20 year wastewater needs.

The attached map delineates the planning area. The 20 years planning period consists of the following phases:

Phase I (0-2 years): This phase includes performing a Sewer System Evaluation Study (SSES) to locate and reduce I/I, at an estimated cost of $100,000. Several modifications to the wastewater treatment facility are also planned. A six million gallon lined earthen lagoon will be constructed for flow equalization if inflow and infiltration cannot be significantly reduced. The existing 0.8 mgd plant is to undergo a 50 percent increase in capacity to be achieved by adding 0.4 mgd oxidation ditch, and an additional clarifier. A belt filter press will be installed for sludge handling. The disinfection facilities will also be upgraded to handle 1.2 mgd of wastewater flow. The total estimated project cost is $7,378,000. These modifications are expected to begin in Phase I and continue during Phase II. Phase I does not include any sanitary sewer extensions.

Phase II (3-10 years): Phase II will consist of a continuation of the WWTP modifications as described in Phase I.

Phase III (11-20 years): Phase III consists of three collection system extensions to serve new and existing residences and businesses within the planning area. An extension of approximately 9,000 feet of combination force and gravity mains is planned to the community of Boneyville, southwest of the city of Stanford. Approximately 30,000 feet of both force and gravity main is planned to connect the high school and Fairgrounds areas, located to the south of Stanford. An extension of approximately 7,500 feet of forced sewer main is planned to the east of Stanford along U.S. 150, to an area experiencing mild development. The collection system extensions will include construction of two new pump stations and appurtenances. The total estimated cost for the combined expansion projects is $2,416,900.

The engineering firm instrumental in preparing the facilities plan for the city of Stanford is MSE of Kentucky, Inc. The project is within the area covered by the Columbia Regional Office of the DOW.

Funding Status: The City of Stanford will fund phase I projects through a combination of grants and loans.

Rural Utilities Service, Loan	$3,728,000
Rural Utilities Service, Grant	$1,598,400
Appalachian Regional Commission	$ 500,000
Kentucky Infrastructure Authority	$1,551,600
Local Funds	$ 100,000
Total	$7,478,000

B. Existing Environment

Topography: The planning area lies primarily within the Southern Knobs area of the Outer Bluegrass Physiographic region in central Kentucky. The topography of the northern part of the county is slightly rolling to hilly. The elevation of the city of Stanford is approximately 945 feet above mean sea level (amsl). Elevations of 1,000 feet or greater are found on the highest hills and ridges in this area. Local relief is commonly 100 to 150 feet. The lowest elevation in the county is approximately 760 feet, at the point where Dix River leaves the northern tip of the county.

Geology: The Stanford Geologic Quadrangle identifies the Borden Formation, New Albany Shale, and some Boyle Dolomite as the upper geologic formations within the planning area. Brassfield Dolomite, Drakes Formation, Ashlock Formation, and Calloway Creek Limestone are also present.

Soils: According to the Natural Resources Conservation Service (NRCS) *Soil Survey of Garrett and Lincoln Counties, Kentucky*, all soil types located within the planning area are classified as having moderate to severe limitations for maintaining effluent from septic tanks and suitability for sewage lagoons. Approximately 92% of the planning area is considered very limited with regard to septic tank absorption and 6.6% is considered somewhat limited, primarily due to slow water movement, depth to bedrock, and slope, supporting the need to extend sewer lines.

Surface Waters: The planning area is located within the Kentucky Basin Unit, Kentucky River Basin, Logan Creek and Boone Creek-Dix River Watersheds.

The segment listed in the *2008 Integrated Report to Congress on the Water Quality in Kentucky,* as meeting assessed designated uses is listed in Table 1.

Table 1 Assessed Segments Supporting Designated Use(s) (source: 2008 Integrated Report)	
Waterbody & Segment	**Fully Supported Designated Use(s)**
Logan Creek 0.0 to 3.15	Warmwater Aquatic Habitat
Hanging Fork 0.0 to 15.85	Warmwater Aquatic Habitat
Hanging Fork 15.85 to 24.15	Warmwater Aquatic Habitat

Impaired segment is listed in Table 2, along with a notation regarding the TMDL status.

Table 2. Assessed Segments **not** Supporting Designated Use(s), with TMDL status (source: 2008 Integrated Report)			
Waterbody & Segment	**Impaired Use Assessment**	**Causes**	**Sources**
Logan Creek 0.0 to 3.15	Non Support Primary Contact Recreation- TMDL Under Development	*Escherichia coli*	Agriculture, Municipal Point Source Discharge
Hanging Fork 0.0 to 15.85	Nonsupport Primary Contact Recreation	*Escherichia coli*, Fecal Coliform	Nonirrigated crop production, On-Site Treatment Systems (Septic & Similar Decentralized Systems), Livestock (Grazing or Feeding Operations), Agriculture
Hanging Fork 15.85 to 24.15	Nonsupport Primary Contact Recreation	*Escherichia coli*	Agriculture

Amendments to the Safe Drinking Water Act require the development of long-range water-supply plans for each county and its municipalities and public water systems. This regulation requires that counties develop county or regional water supply plans that assess the quantity of water used by their public water systems and formulate protection plans for the source waters used by those systems. With respect to source water assessment and protection program (SWAPP), the regulation specifically requires public participation, delineation of source water watersheds and recharge areas for each public water supply source, a contaminant source inventory with relative susceptibility (risk) assessment and recommendations for protection. Within these designated source water, zones may be designated to encompass activities closest to the intake with the area of highest concern and least travel time, to areas further away and of less concern. Zone I is commonly called the Critical Zone; Zone II may be called the Zone of Responsibility, and Zone III may be called the Zone of Potential Impact. These zones provide a means by which contaminants may be inventoried and managed. There are two Zone SWAPP areas: Stanford Water Works Reservoir and Neals Creek. There are no Exceptional Use Waters or Outstanding State Resource Waters within the planning area.

Dix River – Herrington Lake is the DOW Priority Watershed located within the planning area. The causes and sources of impairment are listed in Table 3.

Table 3. Division of Water Priority Watershed assessment (source: 2008 Integrated Report)		
Name of Watershed	**Causes**	**Sources**
Dix River – Herrington Lake	Lake: metals, nutrients and OE/low DO Stream: pathogens, siltation, OE/low DO	Agriculture, Land Disposal, Internal Nutrient Cycling, Unknown Sources

Numerous water providers serve within the proposed planning area: Mckinney Water District, Eubank Water System, Garrard County Water Association and Stanford Water Commission.

Groundwater: According to *Groundwater Resources of Lincoln County, Kentucky* (Kentucky Geological Survey, 2004) approximately 3,400 residents of Lincoln County rely on private domestic water supplies: 1,500 use wells and 1,900 use other sources. North of U.S. 150, in the valleys of Hanging Fork of the Dix River and the Dix River, most drilled wells will produce enough water for a domestic supply at depths of less than 100 feet. In most of the county, wells located in creek and river valleys will produce enough water for a domestic supply, except during dry weather. In the upland areas (80 percent of the county), most drilled wells will not produce enough water for a dependable domestic supply, unless they are drilled along drainage lines, in which case they may produce enough water except during dry weather. Throughout the county, groundwater is hard or very hard and may contain salt or hydrogen sulfide, especially at depths greater than 100 feet. According to the KY DOW, Groundwater Section, the planning area has moderate sensitivity to groundwater pollution.

C. Existing Wastewater Facilities

Wastewater Treatment Plant: Stanford's existing 0.8 mgd WWTP was originally constructed in 1987 with two 400,000 gallons per day oxidation ditches, two clarifiers, aerobic sludge digesters, sludge drying beds and chlorine disinfection. Currently, the City utilizes sludge drying beds and facilities for land spreading. When weather permits, sludge is disposed by land spreading in an area north of Highway 642. When land spreading is not feasible, sludge is sent to Tri-K landfill.

The WWTP discharges pursuant to Kentucky Pollutant Discharge Elimination (KPDES) Permit No. KY0024619 into Logan Creek at mile point 2.0. The annual average flow rate from June, 2008 through May, 2009, was 0.93 mgd, with an average peak flow of 2.18 mgd. Effluent quality routinely exceeds permitted limits. An Agreed Order to address the operation and maintenance, and compliance issues has been drafted with the Division of Enforcement; however, has not been executed yet.

Monthly average effluent limits (mg/l unless otherwise noted) that must be met by the existing WWTP are as follows:

Parameters	Limits
$CBOD_5$	10
Total Suspended Solids	30
Ammonia Nitrogen	2 (Summer)/10 (Winter)
Total Phosphorus	Monitor
Dissolved Oxygen	Not less than 7
Total Residual Chlorine	0.011
Fecal Coliform	200 colonies/100 ml

There are no known sanitary sewer overflow (SSO) locations in the city of Stanford collection system.

Collection System: Stanford's existing collection system was constructed in 1954 and consists of pipe ranging from 8-18 inches in diameter and two duplex pump stations. Most pipe is PVC and most manholes are precast, however, some vitrified clay pipes (VCP) and brick manholes are still present. The collection system is experiencing excessive I/I. Stanford propose to conduct SSES in Phase I of the planning period to study the problem and prepare a corrective action plan.

D. Need for the Project

The proposed project is needed to improve the local water quality and public health by improving the quality of effluent from the WWTP, eliminating failing septic systems and straight pipes, and reducing I/I. The 2008 Integrated Report to Congress on Water Quality in Kentucky reports that *Escherichia coli* is present in the waters of Logan Creek from mile 0.0 to mile 3.15. This is likely due to a culmination of bypass events at the WWTP (due to excessive I/I), failing septic systems, and straight pipes. The Lincoln County Health Department has identified multiple areas within or near the planning area with documented septic tank issues or straight pipe discharges. An Agreed Order has been initiated with the DOW that will require the City to conduct an SSES and implement corrective actions, magnifying the need for the proposed projects. The Stanford Facilities Plan addresses the abovementioned items and also accounts for normal growth within the planning area. The population is expected to increase from 3,430 in 2000 to 3,568 in 2020. The projected wastewater flow for the year 2020 is 1.07 MGD, excluding industrial contributions.

E. Alternatives Analysis

Wastewater Treatment Alternatives:

Alternative No. 1 – *No Action*: The no-action alternative consists of the continued use, maintenance and operation of the existing WWTP without modification. This alternative is deemed unacceptable because it does not bring the WWTP into compliance with its discharge permit limits.

Alternative No. 2 – *Expand the Existing WWTP*: Stanford's existing WWTP was designed to allow for expansion using the same treatment process. Because the existing facilities are in good condition, neither a new site nor a new treatment process was considered further. However, multiple component alternatives were considered:

- Two alternatives for an equalization basin were considered for flow equalization at the WWTP; a steel standpipe and an earthen lagoon. Either selection would serve the same function; storing excess inflow and infiltration during storm events for treatment when flows return to normal. The estimated cost of a steel standpipe was $3.6 million. The estimated cost of the lined earthen lagoon was $1.6 million. **The earthen lagoon was the selected alternative, with drastically lower capital and operation and maintenance costs.**

- Three alternatives for expanding the WWTP were considered: construction of a single 0.4 MGD oxidation ditch; two 0.4 MGD oxidation ditches; and one 0.8 MGD oxidation ditch. **The single 0.4 MGD ditch was selected with the provision to add additional 0.4 MGD ditches, as needed, based upon future demand.**

This alternative will also involve construction of 0.4 mgd clarifier, 1.2 mgd anaerobic digestor, ultraviolet disinfection system, sludge building and belt filter press. The proposed WWTP expansion must be designed to produce the following monthly average effluent limits (mg/l unless otherwise noted):

Parameters	Limits
$CBOD_5$	10 mg/l
Total Suspended Solids	30 mg/l
Ammonia Nitrogen	2 mg/l (summer), 5 mg/l (winter)
Total Phosphorus	Monitor
Total Nitrogen	Monitor
Dissolved Oxygen	7 mg/l
Total Residual Chlorine	0.011 mg/l
Escherichia coli	130 colonies/100 ml
Toxicity	1.0 TUc
Reliability Class	Grade 2

The estimated cost of the project is $7,378,000 with 20 year present worth of $10,935,000. **This is the selected alternative as it will have a positive impact on the water quality of the local water bodies.**

Collection System Alternatives:

Alternative No. 1 – *No Action*: This alternative involves no expansion or modification to the existing collection system within the city of Stanford. This alternative was rejected from consideration because it does not meet the current and future wastewater needs of the planning area. Water quality in the area would likely degrade further since most of the soils within the planning area are not conducive to on-site systems disposal. This alternative was not considered environmentally responsible and eliminated from further consideration.

Alternative No. 2 – *Expansion of the Existing Wastewater Collection System*: This alternative consists of approximately 46,500 LF of combined gravity sewer and force main along three separate alignments, and two new pump stations. The extensions are planned for Phase III and will include areas currently relying on septic tanks, drainage fields, or straight pipes. The probable project cost is $2,416,900. **This is the selected alternative because it allows the City of Stanford to meets its future needs and leads to improving the water quality of local streams.**

F. Environmental Consequences and Mitigative Measures

Impacts on Historic Properties and Archaeological Sites: The Kentucky Heritage Council stated in Clearinghouse comments dated April 30, 2008, that improvements to the existing WWTP do not require a survey, however, the equalization basin/earthen lagoon project area must be surveyed by a professional archaeologist to determine if sites eligible for listing in the National Register of Historic Places will be affected by the undertaking. A professional archaeological survey of the WWTP expansion site was conducted on January 12, 2009, by Dr. Jack M. Schock of Arrow Enterprises. No archaeological sites were located and no further archaeological work was recommended. The report was reviewed by the State Historic Preservation Office, which found that the requirements under the Section 106 review process for archaeology is fulfilled for the Phase II, WWTP expansion project.

Impacts on Threatened and Endangered Species: The United States Fish and Wildlife Service (USFWS) was solicited for comments regarding the Phase II, WWTP expansion on January 9, 2009. The USFWS replied in correspondence dated February 27, 2009, stating that based upon the acceptance of tree clearing restrictions (no trees will be removed between April 1 and October 14), and the absence of any potential winter habitat, the project will not result in any significant negative impacts to Indiana bats. The USFWS has requested that the most stringent sediment and erosion control best management practices are followed, as agreed to on November 4, 2008, by the city of Stanford.

Impacts on Floodplains:
The proposed activity appears to need a floodplain permit (Permit to Construct Across or Along a Stream) pursuant to KRS 151.250. Any construction in the floodplain will need either a permit or an exemption letter.

Impacts on Air Quality:
Kentucky Division for Air Quality Regulation 401 KAR 63:010 Fugitive Emissions states that no person shall cause, suffer, or allow any material to be handled, processed, transported, or stored without taking reasonable precaution to prevent particulate matter from becoming airborne. Additional requirements include the covering of open bodied trucks, operating outside the work area transporting materials likely to become airborne, and that no one shall allow earth or other material being transported by truck or earth moving equipment to be deposited onto a paved street or roadway. Please note the Fugitive Emissions Fact Sheet located at http://www.air.ky.gov/homepage_repository/e-Clearinghouse.htm

Kentucky Division for Air Quality Regulation 401 KAR 63:005 states that open burning is prohibited. Open Burning is defined as the burning of any matter in such a manner that the products of combustion resulting from the burning are emitted directly into the outdoor atmosphere without passing through a stack or chimney. However, open burning may be utilized for the expressed purposes listed on the Open Burning Fact Sheet located at http://www.air.ky.gov/homepage_repository/e-Clearinghouse.htm

Other Impacts:
Impacts to the natural environment in and around the project area will be minimal and temporary in nature. The only foreseeable impacts associated with the project include a temporary increase in construction noise, traffic disruption, service disruption, and minor air pollution.

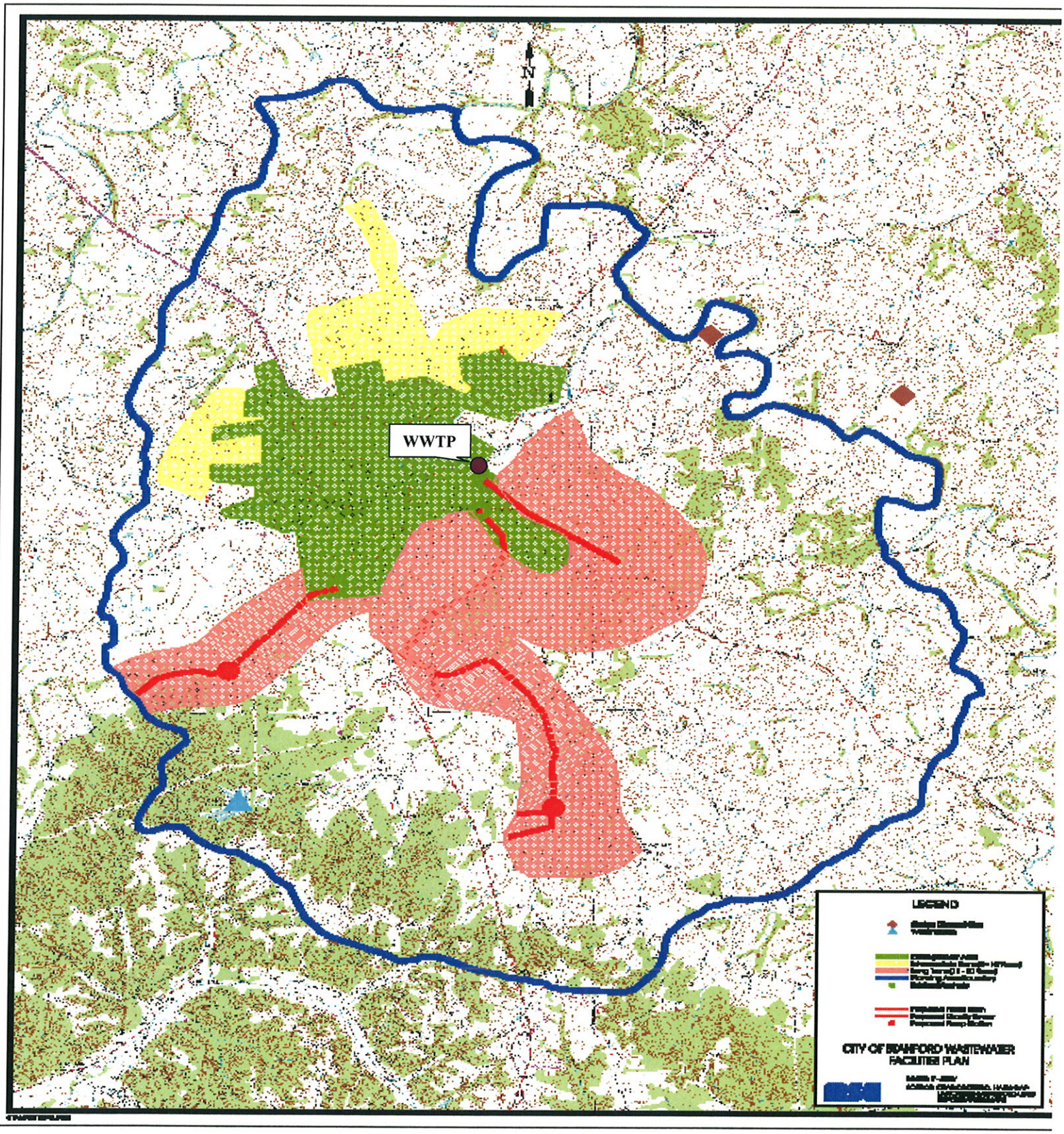
G. Public Participation and User Rates

A public meeting was held on July 17, 2003, at the Stanford City Hall to discuss the proposed facilities plan. The meeting notice was published in *The Interior Journal* on June 12, 2003. No negative comments were recorded. A more recent public meeting was held on December 2, 2008 at Stanford City Hall to explain to the public an updated scope of work and possible funding scenarios and rate increases. No negative comments were recorded. The Division of Water is not aware of any unresolved public objections that may have been voiced before or after the public meeting in relation to the proposed project. Based on monthly water usage of 4,000 gallon, the current sewer rate for in town users is $13.13 and is expected to increase to $17.61, whereas the current sewer rate for out of town users is $15.13 and is expected to increase to $26.77 depending on the amount of grants the city can secure.

H. Sources Consulted

Kentucky Department of Fish & Wildlife Resources
Kentucky Division for Air Quality

Kentucky Division of Forestry
Kentucky Division of Waste Management
Kentucky Division of Water
Kentucky Heritage Council
Kentucky State Clearinghouse
Natural Resources Conservation Service Web Soil Survey
U.S. Fish & Wildlife Service
MSE of Kentucky, Inc.
Bluegrass Area Development District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